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Malignant Melanoma metastacizing to the Thyroid Gland: A Case Report and Review of the Literature

Brian Kung
Thomas Jefferson University

Saba Aftab
Thomas Jefferson University

Moira Wood
Thomas Jefferson University

David Rosen
Thomas Jefferson University, david.rosen@jefferson.edu

Malignant Melanoma Metastasizing To The Thyroid Gland: A Case Report And Review Of The Literature

Brian Kung, MD; Saba Aftab, BS; Moira Wood, MD; David Rosen, MD

Department of Otolaryngology – Head and Neck Surgery, Department of Pathology, Anatomy, and Cell Biology

Thomas Jefferson University Hospital, Philadelphia, PA

Abstract

Objectives: The thyroid gland is a relatively uncommon site for secondary malignancy. Even less common is metastasis of malignant melanoma to the thyroid gland. We present a case of malignant melanoma metastatic to the thyroid gland presenting as thyroid enlargement.

Study Design: This is a case report which utilizes chart review, intraoperative photographs, radiographic images, and pathology slides.

Methods: A 68 year old patient with no prior evidence of primary skin melanoma presented with a neck mass which tested positive for melanoma. A year and a half following modified radical neck dissection, the patient presented with a diffusely enlarged thyroid gland from which fine needle aspiration revealed metastatic malignant melanoma.

Results: A few months following this, the patient began having seizures and was found on MRI to have metastatic disease to the brain. He developed ventilator dependent respiratory failure and required a subtotal thyroidectomy for the placement of a tracheostomy tube.

Conclusions: Patients with a history of malignancy and a thyroid nodule present a diagnostic dilemma—is it benign, a new primary, or distant metastasis? Review of this case and the literature strengthens the argument that any patient with a history of malignancy and a thyroid mass should be considered as having metastasis until proven otherwise.

Introduction

The incidence of metastasis to the thyroid gland in autopsy series has been reported to range between 1.25-24%[1]. The most common sources of metastases are renal cell carcinoma, breast carcinoma, and lung carcinoma[1,2]. Clinically apparent spread of malignant melanoma to the thyroid gland is rare, accounting for less than 5% of metastatic tumors to the thyroid[1].

We present a case of a patient with malignant melanoma metastatic to the thyroid gland as an early manifestation of distant metastatic disease, as well as a review of the literature.

Case Report

A 68-year-old male with a 30 pack year tobacco history presented with a 1.5cm left posterior triangle neck mass. Physical exam and radiographs performed at the time failed to reveal a primary tumor. An FNA of the mass at the time revealed a poorly differentiated squamous cell carcinoma. The patient was taken to the operating room for staging endoscopy and a repeat FNA. Again, there was no evidence of a primary lesion, but FNA at this time was suggestive of melanoma, and this diagnosis was confirmed via immunophenotyping, which showed the cells staining positive for Melan A and S-100 (**Figure 1**). Biopsies of the tonsil, nasopharynx and tongue base were negative. The patient then underwent a left modified radical neck dissection. The posterior triangle mass was discovered to be a lymph node which tested positive for malignant melanoma. All other nodes were negative. No primary site for the melanoma was found, and the patient was scheduled for radiation therapy and chemotherapy. However, the patient was reluctant to receive these treatments during follow-up.

Eighteen months later, the patient presented with a 10cm midline neck mass representing a diffusely enlarged thyroid gland. An FNA was performed which revealed melanoma. The patient underwent an MRI of the neck, revealing a diffusely enlarged cystic thyroid gland with no cervical adenopathy (**Figure 2**). Two weeks later, the patient began having seizures, and an MRI of the brain revealed a 1.7cm mass in the region of the anterior superior vermis, with associated mass effect and mild hydrocephalus. This was suspicious for metastasis. A CT scan of the chest, abdomen, and pelvis was obtained, showing a soft tissue lesion in the suprapubic region consistent with metastasis. The patient soon developed ventilator dependent respiratory failure, and was taken for a subtotal thyroidectomy for establishment of a tracheostomy (**Figure 3**). Histology showed the thyroid largely being replaced by metastatic melanoma with extensive necrosis (**Figure 4**). The patient subsequently required placement of a ventriculoperitoneal shunt to treat the hydrocephalus secondary to the metastatic brain lesion.

Discussion

The case presented above is similar to the few other case reports detailing metastatic melanoma to the thyroid gland. As with our patient, the most common complaint among patients with metastatic disease to the thyroid gland is a neck mass[3,4]. Some authors have found that the pathology shows replacement of the thyroid by melanoma, but thyroid function remains preserved[5-7]. Our patient had no evidence of hypothyroidism—his laboratory abnormalities (slightly decreased TSH, normal free T4) likely represent the slight variation in thyroid function tests seen in euthyroid sick syndrome. Shimaoka et al describes a likely explanation for this phenomenon—it takes weeks to months for total ablation of thyroid function to manifest as hypothyroidism, and most patients do not survive long enough with metastatic tumor for hypothyroidism to become apparent[8]. It has been suggested that pre-existing abnormalities of the thyroid, such as nodules or adenomas, predisposes it to metastatic lesions9,10. Our patient did not have such abnormalities.

Various autopsy studies have revealed the incidence of malignant melanoma metastasizing to the thyroid gland to be high. Although Nakhjavani et al[1] found melanoma to account for less than 5% of clinically apparent metastatic thyroid tumors, autopsy studies have shown the number to be as high as 35% of all metastatic lesions to the thyroid[9]. The disparity can be explained by the fact that in autopsy studies, metastatic lesions are discovered only upon microscopic examination of small, careful cuts of the gland. In autopsy studies focused only on patients with melanoma, Patel et al found the incidence of thyroid metastases to be 26% in the 261 autopsies performed[11]. Shimaoka et al found thyroid metastases in 39%[8]. It is not surprising that melanoma has such a high propensity for the thyroid given its vascularity and the hematogenous route of spread. Melanoma has the ability to metastasize to almost every organ, with the most common sites being lungs, liver and brain[11]. Although patients with melanoma may have thyroid metastases without consequence, it is rare that a mass in the thyroid would be their only clinically apparent sign of metastatic melanoma. Although our patient was discovered to have additional inguinal lymph node and brain metastases during his hospital course, it was his enlarged thyroid gland that was the early indication of distant metastases.

Metastases of any malignancies to the thyroid are much more common than one would expect. The incidence of metastases in the thyroid gland is fairly high in patients with known metastatic tumors. One autopsy study of 7332 patients with known malignancy showed 2.8% with thyroid metastases[14]. Others have reported incidences as high as 9.5%[8]. Combining studies, a representative figure is 5-6%. These surprising numbers have prompted some to state that metastatic thyroid neoplasms may be 10 times as numerous as primary thyroid cancers[8]. Watts reports that of six patients presenting with a thyroid nodule who had a past history of malignancy, four had cytologic evidence of metastasis[12]. This led him to conclude, along with Shimaoka et al, that in a patient with a history of cancer, a metastatic thyroid nodule is more likely than a primary[8,12].

Our case allows for discussion of the diagnosis and management of thyroid metastases. FNA has been reported to be the initial procedure of choice in diagnosis of metastatic lesions to the thyroid[12,13]. Once discovered, metastases to the thyroid must be managed very differently than lymphomas or primary thyroid tumors. A secondary neoplasm to the thyroid indicates a poor prognosis. Metastases to the thyroid predominates in the 6th-8th decades of life, and these patients additionally have a worse prognosis secondary to advanced age[2,4]. More importantly, thyroid metastases are usually part of a widely disseminated malignancy. In most reports of metastases to the thyroid gland, other metastatic deposits are identified at or soon after the discovery of the lesion. With the exception of metastases from renal cell carcinoma, Rosen et al showed patient survival less than 2 years after discovery of thyroid metastases[13]. McCabe et al reported an average survival of 12 months[4]. In discussing melanoma specifically, patients with metastatic melanoma have a median survival of 24 months, irrespective of site of metastasis11. Less than 1% of melanoma patients have single organ metastasis, and when combined with other poor prognostic indicators, surgical management of metastatic melanoma is most often limited to palliative measures11. Thyroidectomy is an accepted procedure for relief from dyspnea or dysphagia, or as in our patient, performing a tracheostomy. In the rare case that the thyroid is the only site of metastatic deposits, thyroidectomy can be curative[3].

Any patient with a history of malignancy and a thyroid nodule presents a diagnostic dilemma. Is it a benign nodule, a new primary, or a metastasis? The FNA can be very helpful in distinguishing these entities. If it represents metastatic disease, is it a "new" metastasis suggesting a neoplastic recurrence, or is it merely the growth of microscopic deposits from a much earlier neoplasm? Others have authored similar dilemmas - Ivy describes melanoma in the thyroid gland years before and years after the primary lesion is discovered[2]. Nakhjavani et al report months between detection of primary malignancy and metastases to the thyroid[1]. Our case is especially difficult as no primary lesion was ever found. However, given the high incidence of thyroid metastases in malignancy, and given the long time period between initial neoplasm and discovery of thyroid metastases, we must agree with Nakhjavani et al that any patient with a previous history of malignancy with a thyroid mass should be considered as having metastases until proven otherwise[1].

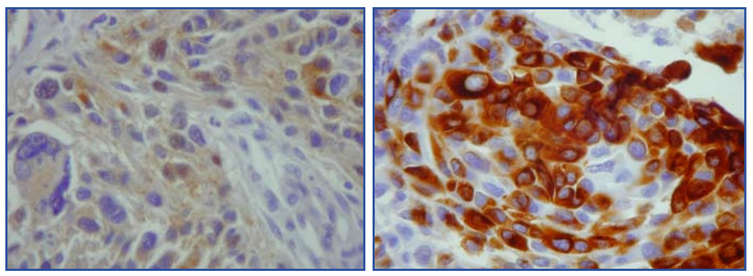

Figure 1: a) S-100 stain of melanoma cells from FNA specimen, b) Melan-A stain from FNA specimen

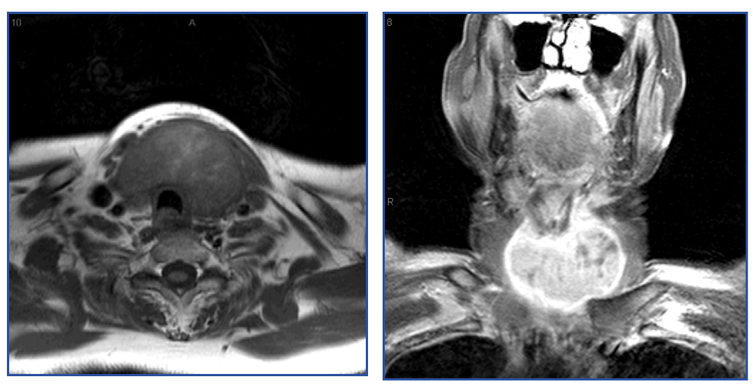

Figure 2: a) Axial T1W MRI showing enlarged thyroid gland, b) Coronal T2W MRI showing similar findings.

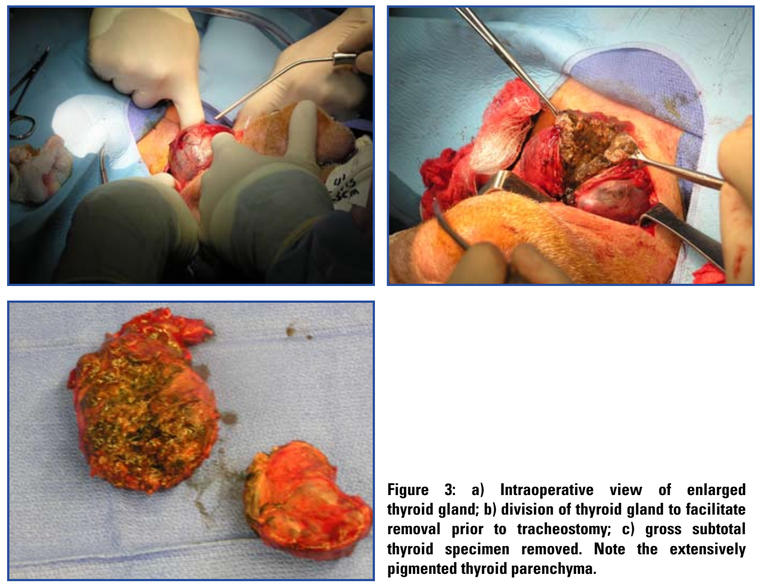

Figure 3: a) Intraoperative view of enlarged thyroid gland; b) division of thyroid gland to facilitate removal prior to tracheostomy; c) gross subtotal thyroid specimen removed. Note the extensively pigmented thyroid parenchyma.

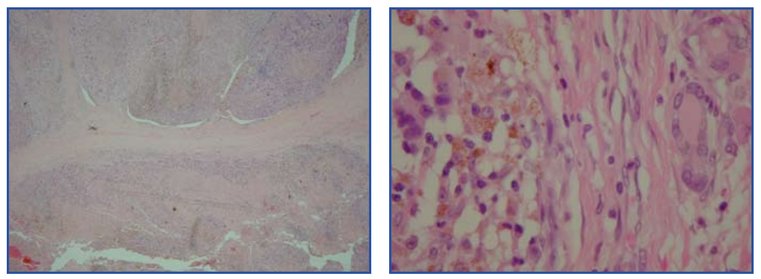

Figure 4: a) H&E stain, 2x view showing extensive replacement of thyroid parenchyma by nests of melanoma and considerable necrosis; b) 40x view showing melanoma on the left and thyroid on the right—two thyroid follicles are seen.

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